Report to the Governor

The Efficacy of Virginia's Capacity Development Strategy

October 1, 2005 to September 30, 2008

All comments or questions on this report may be directed to the:

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Introduction

This report has been prepared pursuant to Section 1420(c)(3) of the Safe Drinking Water Act (SDWA), and constitutes the third report on Virginia's Capacity Development Strategy for public waterworks. That section requires that the agency *"shall submit a report to the Governor that shall also be available to the public on the efficacy of the strategy and progress made toward improving the technical, managerial and financial capacity of water systems in the state"*. The first report was required two years after the date the state first adopted a capacity development strategy under that section, and subsequent reports are required every three years thereafter.

The capacity of a public waterworks is comprised of technical, managerial, and financial (TMF) components that reflect the water purveyor's ability to reliably produce and deliver abundant, pure drinking water to consumers. Technical capacity is seen in the physical elements of a waterworks – its water source and infrastructure – and in the knowledge and skill needed to properly operate the facility. Managerial capacity is evident in a waterworks' planning and organizational expertise. Financial capacity is evidenced by the waterworks' ability to ensure sufficient revenue to meet operational, maintenance, or expansion costs.

The technical, managerial, and financial elements that constitute capacity are interdependent; all three elements are essential for ensuring the viability of a public water supply. Strength or weakness in one element of capacity can in turn either bolster or impair the other elements. For example, a waterworks that demonstrates strong financial capacity by setting adequate service rates is in turn able to make appropriate plans for future infrastructure maintenance.

The SDWA requires states to develop and implement programs that will help all new and existing public waterworks possess sufficient TMF capacity to ensure and enhance their continued operation. To fulfill this requirement, the Virginia Department of Health Office of Drinking Water (ODW) has devised a Capacity Development Strategy, which was approved by the Environmental Protection Agency (EPA) in 2000.

Background

Virginia's approved Capacity Development Strategy is comprised of three main components. First, the strategy requires ODW to possess and exercise sufficient authority to prevent the creation of a new waterworks if the proposed facility cannot guarantee adequate TMF capacity to sustain its long-term viability. To meet this objective, ODW uses processes and procedures for issuing waterworks construction and operation permits as a control point. Secondly, ODW must ensure that waterworks receiving financial assistance through the Drinking Water State Revolving Fund (DWSRF) have or will achieve sufficient TMF capacity before funds are disbursed. Finally, the strategy requires ODW to have the means to assess, prioritize, and respond to the capacity limitations of existing waterworks.

When developing the Capacity Development Strategy, ODW recognized that the means for addressing capacity concerns were already significant, well-established elements of many of its routine interactions with waterworks. For example, the sanitary survey program administered by ODW involves careful evaluation of the condition of waterworks infrastructure, operational practices, and water quality indicators. All of these elements directly reflect the TMF status of the waterworks, and reveal areas of TMF strength or weakness at the facility.

The goal of improving the TMF capacities of waterworks has infused the activities conducted by ODW. Assistance to both new and existing waterworks is an ongoing, integral part of ODW's daily mission of service to Virginians.

The following sections of this report describe the efforts undertaken by ODW to implement Virginia's Capacity Development Strategy during federal fiscal years 2005 through 2008.[1] Program activities are discussed, with emphasis on their relevance to the assessment and enhancement of capacity development. The program activities described apply to all classifications of the 2,937 public waterworks in Virginia: community, non-transient non-community, and transient non-community. Figure 1 shows the composition of these waterworks classifications, and the populations served by each classification.

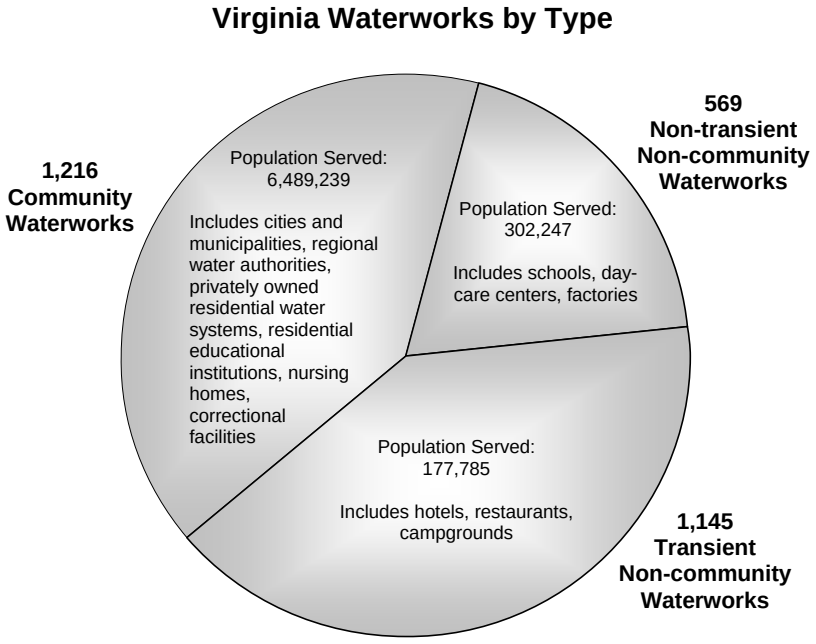

Figure 1

[1] Data provided throughout this report reflect only partial data from September 2008, for which information was incomplete at the time of writing.

Sanitary Survey Program

The sanitary survey program allows ODW staff to perform onsite inspection of waterworks and affords opportunities for the assessment of waterworks for TMF capacity. During the course of a sanitary survey, ODW personnel conduct thorough evaluations of waterworks infrastructure and water treatment processes. Water quality monitoring records are reviewed, and operational practices and controls are examined. Waterworks staff qualifications are assessed.

Through the sanitary survey process, waterworks' capacity needs are identified, prioritized, and targeted for guidance and assistance from ODW staff. The culmination of the sanitary survey is a written report which serves as a roadmap for waterworks owners to follow for correcting waterworks deficiencies or improving waterworks operation.

In addition to routine sanitary surveys, ODW personnel conduct special sanitary surveys of waterworks, consisting of site visits to evaluate new construction, investigate consumer complaints, and respond to specific requests for assistance. Site visits are also made to perform Source Water Assessments, and to evaluate the locations of proposed new wells. The hallmark of these site visits is the opportunity afforded for direct, face-to-face interaction with waterworks owners and operators, allowing the provision of immediate guidance on interventions to improve TMF capacity.

During the reporting period, ODW staff performed 6,163 routine sanitary surveys, 1,029 special sanitary surveys (including inspection of new construction, complaint investigations requiring field visits, and delivery of onsite assistance), and 490 site visits to assess water sources. Field activities performed by ODW staff are summarized in Figure 2.

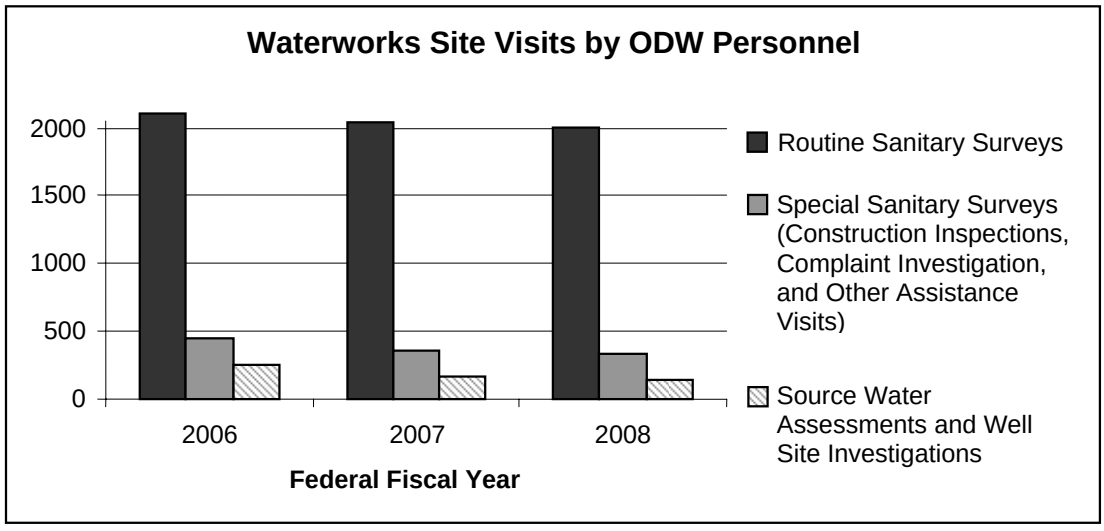

Figure 2

Assistance Contacts Reported by Field Staff

In addition to site visits, ODW staff interacts with waterworks owners and operators and provides assistance through a variety of informal contacts including meetings, telephone calls, and emails. Assistance is given that covers a full range of TMF concerns. For instance, help may be given to address water quality sampling needs, or to follow up on corrective measures described in a sanitary survey report. Waterworks operators may be apprised of upcoming training opportunities or offered help with water treatment dosage calculations. Owners may be advised of impacts or requirements of pending regulations for consumer education. During the reporting period, ODW staff received and responded to 35,134 assistance requests from the owners and operators of Virginia's public water supplies.

Source Water Assessment and Source Water Protection

In April 2003, ODW completed a focused effort to perform Source Water Assessment Reviews on all public water supplies that were active at that time. These assessments were designed to reveal the potential vulnerabilities to manmade contamination that water supplies might face. The assessments serve as a tool for water supply resource planning, and specifically support waterworks managerial capabilities. ODW continues to perform assessments on new waterworks and to update historical assessments as a result of ongoing field observations made during sanitary surveys.

In July 2003, ODW created a Wellhead Protection Plan Development Program for small community groundwater waterworks in central and western Virginia. The goal of the program is to identify waterworks interested in program participation and assist participating waterworks in the development and implementation of source water protection plans. The program delivers technical support from a contract provider to small water systems serving less than 3,300 persons. The resulting protection plans enable the participating waterworks to take steps to safeguard their drinking water sources, by managing and controlling activities in the vicinity of the source that could compromise water quality and quantity. To date, participation in this program has enabled sixty-two small water systems to prepare and implement site-specific Wellhead Protection Plans. Other program activities included contacting 258 waterworks to determine interest, making 40 program presentations, and holding 67 Local Advisory Committee meetings to facilitate implementing the program.

Construction Plans and Permit Review

ODW approved 1,349 permit applications and 1,417 plans and specifications for new construction or system improvements during the reporting period. The approval of permit applications is especially noteworthy in regard to capacity development. ODW uses authority via the *Code of Virginia* §§32.1-169 and 32.1-172B, and §12VAC5-590-190 of the Virginia *Waterworks Regulations* to prohibit the establishment, construction, or operation of a water supply without a written permit, and requires the submission of TMF information in the application for a permit. Permitting authority for construction and operation is used as a control point to prevent the creation of waterworks lacking sufficient TMF capacity to sustain

operations. Permits are issued only to waterworks able to demonstrate the potential for long-term TMF viability.

There is a five-step application process that each potential waterworks must complete satisfactorily before a permit to construct will be issued. The application process includes:

- notification of intent;
- preliminary engineering conference;
- submission of a Preliminary Engineering Report (PER);
- submission of a Waterworks Business Operation Plan (also known as a Comprehensive Business Plan), which includes background information on the qualifications of persons involved with the system; operations and maintenance information; technical data to supplement the PER; financial data projecting expenses and revenues; identifying sources of funds and financial controls; and
- submission of final plans and specifications.

After construction, the waterworks owner must submit a statement by a licensed professional engineer that the construction work was completed in accordance with the approved plans and specifications, based on inspections of the waterworks during and after the construction. Upon receipt of the statement, ODW issues a permit to operate. The permit also establishes the classification of the waterworks for the purpose of setting licensure requirements for personnel.

These procedures ensure that a new waterworks starts with infrastructure that is designed and constructed to provide an adequate supply of pure water, and that the facility will be adequately staffed by skilled, appropriately licensed staff. These measures also compel prospective owners to plan for long term financial viability.

Assistance Related to Comprehensive Business Plan Contract

Prior to issuing operations permits, ODW uses the review of Waterworks Business Operation Plans (WBOPs) as a screening tool for proposed new waterworks, and for existing waterworks under new ownership. Business plans are also required of potential recipients of DWSRF financial assistance, and they are often used as a corrective measure during enforcement proceedings.

In the process of preparing WBOPs, waterworks gain a valuable resource for strengthening their managerial and financial capacities. The planning process gives waterworks tools for establishing effective budgets, appropriate service rates, and financial reserves to sustain long-term viability. Plans must include an inventory of infrastructure assets, anticipated operational and maintenance expenses, monitoring costs, and revenue sources.

In 2007 ODW developed a suite of business plan worksheets, along with guidelines for ODW staff to follow when evaluating the plans submitted by waterworks. The worksheets are available to the waterworks through the ODW web site at http://www.vdh.virginia.gov/drinkingwater/owners/permit_applications_wbop.htm .

The web resources consist of the following:

- A handbook for community and nontransient noncommunity waterworks
- Companion financial worksheets for the handbook
- A simplified worksheet for transient noncommunity WBOPs

These documents are designed to be accessed and completed online, though copies can also be printed and distributed to waterworks owners to complete manually.

Contaminant Vulnerability Assessments for Issuing Monitoring Waivers for Some Classes of Contaminants

ODW staff reviewed and assessed 1,898 applications for monitoring waivers from eligible waterworks during the reporting period. For some groups of man-made chemical contaminants, waterworks may forgo routine water quality monitoring if they can demonstrate that the source is located and constructed in a way that eliminates susceptibility to the contaminants, and that the source is not vulnerable to contamination because the chemicals are not in use in the vicinity of the source. The waiver application process involves a self-assessment of the source's susceptibility and vulnerability by waterworks owners; application review affords ODW an opportunity to screen waterworks for conditions that may impair water quality. The waiver process encourages TMF capacity by highlighting beneficial planning efforts that the owner can take to protect water sources.

Compliance and Enforcement Program

ODW routinely reviews water quality data submitted by public waterworks, and issues Notices of Violation (NOVs) for water that does not meet the standards contained in the Virginia *Waterworks Regulations*. NOVs are also issued for monitoring infractions, improperly licensed staff, recordkeeping and reporting failures, or for other conditions that deviate from standards established by the SDWA and the Virginia *Waterworks Regulations*. During the reporting period, ODW sent 5,920 NOVs to noncompliant waterworks; approximately 60% of those were for monitoring violations, that is, violations incurred because of waterworks failure to collect, analyze, and report required water quality samples.

In cases of chronic or egregious noncompliance, ODW issues administrative orders to compel corrective measures that will lead to compliance. As required by Virginia state law, hearings are conducted to give parties their due process rights under the law before issuing adverse decisions. ODW has authority to issue binding consent orders and unilateral special orders to waterworks owners who have violated the regulations; both orders set timelines for bringing the waterworks into compliance.

ODW focuses these enforcement efforts on waterworks deemed to be significantly noncompliant (SNC), based on compliance criteria employed by EPA. Quarterly SNC reports are used to prioritize staff allocation of assistance to waterworks with numerous or especially serious compliance failures. During the reporting period ODW issued 25 administrative orders with schedules to bring waterworks into compliance.

ODW employs an enforcement approach that is highly focused on identifying solutions to the underlying causes of waterworks' noncompliance with state and federal drinking water regulations. Various enforcement tools are used to direct attention and provide guidance to waterworks owners on ways to correct deficits in their TMF capabilities. For instance, during the course of an administrative enforcement hearing it may be determined that inadequate waterworks revenues are the ultimate cause of chronic monitoring failures. The waterworks may be asked to submit a Waterworks Business Operations Plan as a budgeting tool, or given assistance with rate setting to address the underlying lack of financial capacity.

Noncompliance with the regulations has been traditionally viewed as a useful reflection of waterworks capacity, and thus of the capacity program's effectiveness. Tracking and addressing compliance failures by waterworks is recognized as an important aspect of assessing and developing capacity. Conversely, compliance with the regulations is also a useful indication of waterworks capacity. A key challenge for the future is to develop measurement tools for assessing the positive impact of compliance on the health and well-being of Virginians.

Data Collection and Analysis

ODW maintains and utilizes the Safe Drinking Water Information System (SDWIS), which is an extensive electronic inventory of waterworks facilities, personnel, sampling data, and compliance status. SDWIS is the primary vehicle by which ODW reports required information to EPA. SDWIS is also the principal repository of data that OWD uses to manage contacts with waterworks, inspection schedules, and compliance sampling data, through an interface called SDWIS Data Reports and Retrieval. Adjunct electronic tracking tools are used to track application and plan review activities. Use of these electronic tools facilitates interaction with waterworks and provides the means to quickly assess many elements related to waterworks TMF capabilities. ODW devoted an average of approximately 10 FTEs to database maintenance during each year of the reporting period.

In July 2001, ODW developed another adjunct electronic tool to complete a baseline assessment of all community and nontransient noncommunity waterworks. These baseline facilities, which served an estimated population of 6.5 million persons, were evaluated and scored based on their compliance status, infrastructure condition, managerial and financial indicators, and their preparedness to respond to impending regulatory impacts. The baseline assessment data were used to make referrals to assistance providers under contract with ODW. For instance, waterworks with low compliance and infrastructure condition scores were offered engineering planning and design assistance. Waterworks scores were also used to set priorities for assistance contacts with waterworks by ODW staff. In early 2008, ODW reevaluated the waterworks and updated database records. The reassessment data was compared to the original baseline assessment to identify areas of continued need.

Waterworks Advisory Committee

The SDWA requires states to identify persons with interest or involvement in the creation and execution of their capacity development programs. To meet this requirement, ODW consults with its Waterworks Advisory Committee, which is comprised of a diverse group of waterworks stakeholders throughout the state. The committee is given opportunities to provide input into the ongoing development of ODW policies and procedures, and is consulted frequently regarding the implementation of specific programs, including those relating to capacity development. The Waterworks Advisory Committee and ODW staff met 16 times during the reporting period.

Operator Licensure

Over 1,800 of Virginia's public waterworks are required to be staffed by licensed operators. Waterworks operators are regulated by the Virginia Department of Professional and Occupational Regulation. As of June 2008, there were a total of 2,269 licensed waterworks operators in Virginia. To qualify for licensure, operators must meet "on the job" requirements and pass a licensure exam. To maintain licensure, operators must meet continuing professional education requirements.

ODW facilitates the development of operators' TMF competencies by offering and sponsoring ongoing operator training. The curricula for these programs include technical topics such as equipment operation and maintenance, drinking water chemistry and microbiology, water treatment technologies, and operator math. Managerial aspects of waterworks operation are addressed through course offerings on the Virginia *Waterworks Regulations*, waterworks administration, source water protection, and waterworks security.

During the reporting period, ODW partnered with Virginia Tech to offer comprehensive training at annual Water Operator Short Schools, which were attended by over 300 operators. To assist very small waterworks, ODW offered:

- Class VI Operators Short Courses and interactive video-teleconferences using Expenditure Reimbursement Grant (ERG) funds. The availability of ERG funds ended September 30, 2007.

- Continuing Professional Education Workshops. This free, interactive video-teleconference service is offered at 13 locations across Virginia on a variety of technical, managerial, and financial topics. Annual attendance is normally between 600 and 700 operators.

- 11 Cross Connection Control workshops.

- A new applied mathematics and basic science course for operators. The course was developed in 2006, piloted in 2007, and offered twice in 2008.

- An annual financial capacity short course entitled *Establishing a Successful and Sustainable Waterworks: Revenues, Rates and Funding*. This course includes topics on determining revenues, setting service rates, and comparing funding mechanisms to specifically address the financial capacity needs of public waterworks.

- Training on new rules and regulations, security and source water protection as needed.

Onsite Assistance and Outreach to Operators and Owners

A key challenge faced by operators and owners of small systems has been securing the time and financial resources to attend formal classroom style training events.

ODW recognized that developing a program to bring individualized training to the operator could make significant improvements in TMF capacity by tailoring training to meet specific needs. In 2006, ODW developed the concept of the "hip pocket" training approach. The idea was that ODW staff would use prepared training materials, conveniently carried in the filed, to respond to an identified need or interest. The approach provides the opportunity for immediate on-site, structured mentoring or training. The ideal time might be at the end of a sanitary survey in response to deficiencies identified during the inspection.

ODW configured two hip pocket tool kits—a groundwater version and a surface water version used by technical staff. Each kit contains a suite of field guides and instruction modules that can support small waterworks that use either groundwater or surface water as a source.

The structured training module is eligible for Continuing Professional Education or CPE credits for the operator. Although these modules are intended to be less than an hour, if combined, several modules may provide a small waterworks operator the hours needed for annual license renewal. This is just one example of an outreach program that ODW has developed to reduce training costs and time for small waterworks.

Each module can be used with a one-on-one mentoring technique that can help replace the technical assistance provider contractors previously funded by the ERG. The module is left with the operator to study and use as a desk reference.

Transfer of Transient Non-community Waterworks Oversight to ODW

Beginning in 2002, the oversight of Virginia's transient non-community waterworks was transferred from the local health departments to ODW, in response to the recommendation of EPA. ODW is now supplying oversight to 1,145 active transient non-community waterworks. This class of waterworks is comprised of businesses such as restaurants, hotels, and campgrounds that operate independent water supplies. For these businesses, the availability of a reliable source or drinking water is essential to business operations, but water production is often an ancillary, low-priority activity. Consequently, for some waterworks, compliance with the Virginia *Waterworks Regulations* often receives scant concern or attention by owners. ODW is providing consistency in implementing the regulations at these waterworks, but key challenges exist, especially from the standpoint of addressing the issue of owners' TMF competencies.

Drinking Water State Revolving Fund

The Drinking Water State Revolving Fund (DWSRF) administered by ODW provides financial aid in the form of loans and grants to water systems in need of infrastructure improvement, maintenance, and development. All waterworks that qualify to receive DWSRF monies are assessed by ODW staff to determine if the waterworks has sufficient TMF capacity before loans are disbursed. During the reporting period, the DWSRF closed on low-interest or interest-free construction loans totaling $36,398,535 to 47 waterworks; planning grants in the amount of $1,364,360 were awarded to 62 waterworks.

Under Virginia's set aside program, a certain portion of funds are allocated for planning and design grants to small, rural, financially stressed, community waterworks that normally would not have the technical ability to evaluate drinking water problems, identify solution alternatives, and make recommendations for correction.

In recognition of the need for small waterworks to actively address water losses due to excessive leakage, ODW revised its planning and design grants criteria in 2006. The revised prioritization criteria added points for leak detection activities for small waterworks. Activities eligible for grant funding include: distribution system surveys and mapping (to include type of pipe material and estimated age), water audits to estimate losses due to leakage, identification of suspected leak locations, training with leak detection equipment, and review of previous detection work. The resulting report typically includes recommended pipe line replacement priorities and schedules, leak detection and repair plans, water audit recommendations, and meter maintenance activities. This activity helps support capacity building as the waterworks are involved in the process from the beginning and benefit from the tools that are generated from the technical assistance provided once completed.

Conclusion

The Capacity Development Strategy is proving to be an effective tool to improve the technical, managerial, and financial (TMF) components of Virginia's public water suppliers' ability to reliably produce and deliver abundant, pure drinking water to consumers. The incorporation of the strategy into the Office of Drinking Water's major program activities and the daily work of staff maximize the potential for successful capacity development. The strategy also protects Virginia's critical water supply infrastructure. As public waterworks improve their TMF capacities, they become better able to prepare for and mitigate the impacts from hazards (natural and man-made).

The Capacity Development Strategy presents to ODW the opportunity to protect Virginia's public waterworks, Without adequate funding and proper staffing, program efficacy could be impaired. The primary challenge to this program continues to be budgetary constraints and staffing limitations that would support the strategy in the future.

Although the Drinking Water State Revolving Fund (DWSRF) has closed on loans of nearly $169 million to date, and the available grant and loan funds have been closely matched to

"ready-to-proceed" project needs, there are continuing public health needs faced by Virginia's public water systems. Since the needs most appropriately addressed by the DWSRF occur in the most financially challenged localities, the unmet need for grants considerably exceeds the supply. An additional challenge has been created by the Federal allotment strategy to states, which is based on a National Needs Survey done every four years. Although the National Needs Survey conducted in 2003 indicated that Virginia's drinking water infrastructure needs had risen since the 1999 survey, it indicated that the state's needs did not rise at the same pace as the total national need. Thus, the DWSRF grant allotment to Virginia for federal fiscal years 2006 through 2009 was reduced by $2.65 million. The 2007 Needs Survey is under administrative review by the EPA at this time. This information will then be evaluated by the Office of Management and Budget before being reported out to Congress in February 2009. This report to Congress will be the first time that the 2007 Needs Survey results will be made public. Based on the recent economic trends, it is possible that, although Virginia's drinking water infrastructure needs continue to increase, the federal grant allotment may be reduced again.

Many localities and waterworks are unable to fully take advantage of drinking water construction funding due to a lack of funds necessary to complete planning efforts. Without adequate grant funds to perform proper project planning, many projects are either never undertaken or are significantly delayed. Virginia has addressed this challenge through the use of state funds that are regularly made available to these localities in the form of grants. This grant fund, which exceeds the required match to the federal DWSRF grant allotment, allows Virginia to initiate more projects across the state, which supports the public health mission.

An increase in the complexity and number of federal drinking water rules that must be implemented, monitored, and enforced has resulted in an increased workload. Additional environmental inspectors are needed to provide technical assistance and perform routine inspections to evaluate the capability of waterworks to deliver an adequate quality and quantity of safe drinking water and to comply with state and federal drinking water standards.

Within these limitations, ODW will continue to implement the Capacity Development Strategy. Funds and staffing will be devoted to those activities most critical to enabling waterworks to have sufficient TMF capacity for provision of safe drinking water.